

(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/057903 A2(51) International Patent Classification⁷: H04NVladimir [IL/IL]; 9 Kinor St., 75575 Rishon Lezion (IL).
BARON, Natan [IL/IL]; 22 Haoren St., 44813 Oranit (IL).

(21) International Application Number: PCT/IL2004/001055

(74) Agent: RECHES, Oren; 13 Hadafna St., POB 913, 42823 Zoran (IL).

(22) International Filing Date: 17 November 2004 (17.11.2004)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
60/528,510 11 December 2003 (11.12.2003) US
60/538,517 11 December 2003 (11.12.2003) US

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, TZ, UG, ZM,

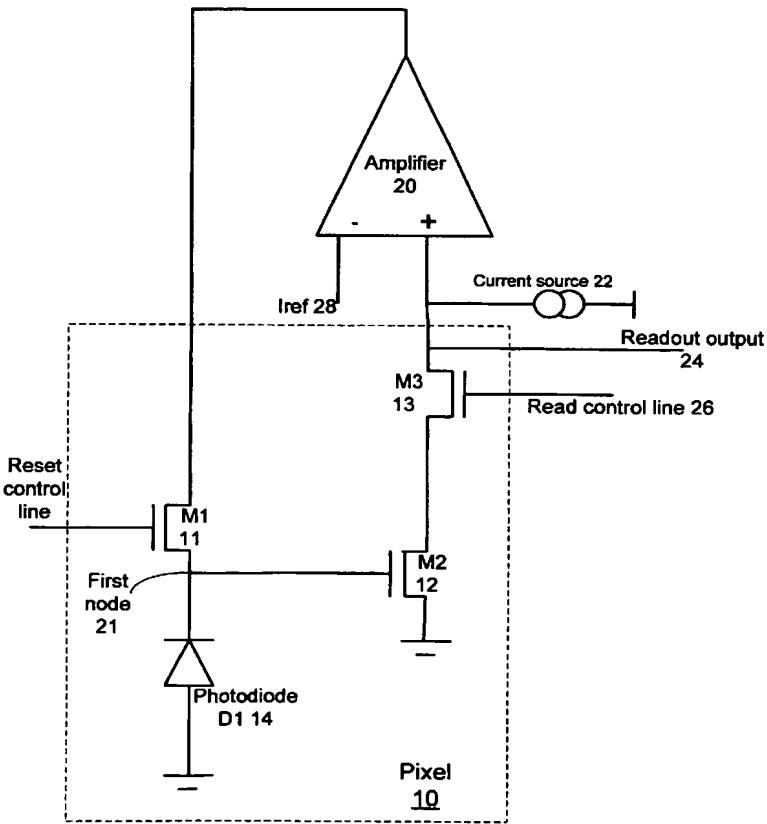
(71) Applicant (for all designated States except US): ADVASENSE TECHNOLOGICS (2004) LTD. [IL/IL]; 11 Hamenofim St., POB 2148, 46120 Herzliya (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): KOIFMAN,

[Continued on next page]

(54) Title: APPARATUS AND A METHOD FOR LOW NOISE SENSING



(57) **Abstract:** The invention provides a method and apparatus. The apparatus includes a pixel adapted to receive light and to output a current representative of the received light; a feedback circuitry, connected to the pixel, adapted to receive said current and to receive a reference current and to provide a feedback signal to the pixel at least during at least a reset stage of the pixel. The method includes: (i) receiving light, by a pixel, and providing a pixel output signal representative of the received light; (ii) receiving, by a feedback circuitry, the pixel output signal; and (iii) providing multiple feedback signals to the pixel at least during a reset stage of the pixel.



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *without international search report and to be republished upon receipt of that report*

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/057903 A3

(51) International Patent Classification⁷: H04N 5/217, 3/14, 5/335, H01L 27/00

(72) Inventors; and
(75) Inventors/Applicants (for US only): KOIFMAN, Vladimir [IL/IL]; 9 Kinor St., 75575 Rishon Lezion (IL). BARON, Natan [IL/IL]; 22 Haoren St., 44813 Oranit (IL).

(21) International Application Number: PCT/IL2004/001055

(22) International Filing Date: 17 November 2004 (17.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/528,510 11 December 2003 (11.12.2003) US
60/538,517 11 December 2003 (11.12.2003) US

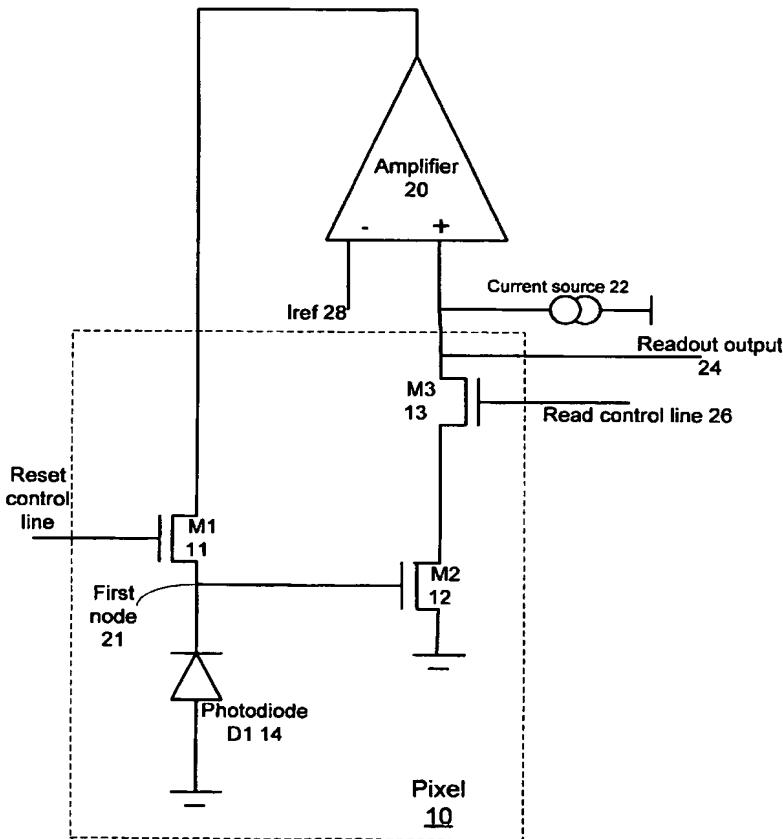
(71) Applicant (for all designated States except US): ADVASENSE TECHNOLOGICS (2004) LTD. [IL/IL]; 11 Hamenofim St., POB 2148, 46120 Herzeliya (IL).

(74) Agent: RECHES, Oren; 13 Hadafna St., POB 913, 42823 Zoran (IL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: APPARATUS AND A METHOD FOR LOW NOISE SENSING



(57) Abstract: The invention provides a method and apparatus. The apparatus includes a pixel (10) adapted to receive light and to output a current representative of the received light; a feedback circuitry (20), connected to the pixel (10), adapted to receive said current and to receive a reference current (Iref) and to provide a feedback signal to the pixel (10) at least during at least a reset stage of the pixel (10). The method includes: (i) receiving light, by a pixel 10, and providing a pixel output signal representative of the received light; (ii) receiving, by a feedback circuitry, the pixel output signal; and (iii) providing multiple feedback signals to the pixel at least during a reset stage of the pixel (10).

WO 2005/057903 A3



(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) **Date of publication of the international search report:**
8 December 2005

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.